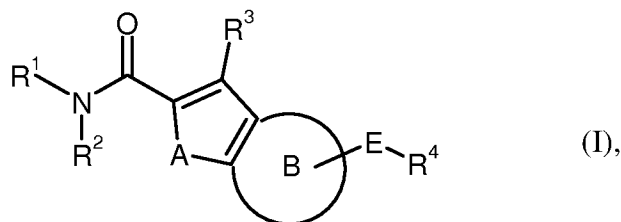


AMENDMENT

It is respectfully requested that the claims be amended without prejudice, as follows. The following listing of claims shall replace all prior claims.

IN THE CLAIMS:

1. (Currently Amended) A compound of formula (I):



in which

R¹ is 1-azabicyclo[2.2.2]oct-3-yl, which is optionally substituted via the nitrogen atom by a radical selected from the group of C₁-C₄-alkyl, benzyl and oxy,

R² is hydrogen or C₁-C₆-alkyl,

R³ is hydrogen, halogen or C₁-C₆-alkyl,

R⁴ is hydrogen, halogen, cyano, amino, trifluoromethyl, trifluoromethoxy, C₁-C₆-alkyl, C₁-C₆-alkylcarbonyl, C₁-C₆-alkylamino, formyl, hydroxycarbonyl, C₁-C₆-alkoxy, C₁-C₆-alkoxycarbonyl, C₁-C₆-alkylthio, C₁-C₆-alkylcarbonylamino, C₁-C₆-alkylaminocarbonyl, C₁-C₄-alkylsulphonylamino, C₃-C₈-cycloalkylcarbonylamino, C₃-C₆-cycloalkylaminocarbonyl, pyrrolyl, C₁-C₆-

alkylaminocarbonylamino, ~~heterocyclylcarbonyl, heterocyclylcarbonylamino,~~
~~heteroarylcarbonylamino,~~ hydroxyl, phenyl ~~or heterocyclyl~~ morpholinyl,
oxypiperidinyl, oxopyrrolidinyl, oxomorpholinyl, pyrrolidinyl,
morpholinylcarbonyl, piperidinyl, pyridinyl, dihydropyrrolylcarbonyl, C₁-C₆-
alkylpiperizinylcarbonyl, isoxazolecarbonylamino,
tetrahydrofuranylcarbonylamino, furoylamino, piperidinylcarbonyl, or
piperidinylcarbonyl,

where C₁-C₆-alkyl may optionally be substituted by hydroxyl, cyano,
amino, C₁-C₆-alkylaminocarbonylamino, C₁-C₆-alkylaminocarboxyl,
~~heterocyclyl~~ morpholinyl or aryl,

C₁-C₆-alkylaminocarbonyl may optionally be substituted by C₁-C₆-alkoxy
or C₁-C₆-alkylamino, and

C₁-C₆-alkylcarbonylamino may optionally be substituted by C₁-C₆-alkoxy,
~~and heterocyclyl may optionally be substituted by oxo,~~

A is oxygen or sulphur,

the ring B is benzo or pyrido, each of which are optionally substituted by radicals
from the series halogen, cyano, formyl, trifluoromethyl, trifluoromethoxy,
nitro, amino, C₁-C₆-alkyl and C₁-C₆-alkoxy,

and

E is $C\equiv C$, ~~arylene and heteroarylene, where arylene and heteroarylene~~ phenylene, thienylene, oxadizolyene, pyrrolylene, furanylene, pyrimidinylene, or pyridinylene wherein each ring system respectively may be substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C_1 - C_6 -alkoxy and C_1 - C_6 -alkyl,

~~or a solvate, a salt or a solvate of a salt~~ thereof.

2. (Currently Amended) The compound of formula (I) of Claim 1, in which

R^1 is 1-azabicyclo[2.2.2]oct-3-yl,

R^2 is hydrogen or C_1 - C_4 -alkyl,

R^3 is hydrogen, fluorine, chlorine, bromine or C_1 - C_4 -alkyl,

R^4 is hydrogen, fluorine, chlorine, bromine, cyano, amino, trifluoromethyl, trifluoromethoxy, C_1 - C_4 -alkyl, C_1 - C_4 -alkylcarbonyl, C_1 - C_4 -alkylamino, formyl, hydroxycarbonyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkoxycarbonyl, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylcarbonylamino, C_1 - C_4 -alkylaminocarbonyl, C_1 - C_4 -alkylsulphonylamino, C_3 - C_6 -cycloalkylcarbonylamino, C_3 - C_6 -cycloalkylaminocarbonyl, pyrrolyl, C_1 - C_4 -alkylaminocarbonylamino, ~~heterocyclylcarbonyl, heterocyclylcarbonylamino, heteroarylcarbonylamino,~~ hydroxyl, phenyl ~~or heterocyclyl~~ morpholinyl, oxypiperidinyl, oxopyrrolidinyl, oxomorpholinyl, pyrrolidinyl,

morpholinylcarbonyl, piperidinyl, pyridinyl, dihydropyrrolylcarbonyl, C₁-C₄-alkylpiperizinylcarbonyl, isoxazolecarbonylamino, tetrahydrofuranylcarbonylamino, furoylamino, piperidinylcarbonyl, or piperidinylcarbonyl,

where C₁-C₄-alkyl may optionally be substituted by hydroxyl, cyano, amino, C₁-C₄-alkylaminocarbonylamino, C₁-C₄-alkylaminocarboxyl, ~~heterocyclyl~~ morpholinyl or aryl,

C₁-C₄-alkylaminocarbonyl may optionally be substituted by C₁-C₄-alkoxy or C₁-C₄-alkylamino, and

C₁-C₄-alkylcarbonylamino may optionally be substituted by C₁-C₄-alkoxy, ~~and heterocyclyl may optionally be substituted by oxo,~~

A is oxygen or sulphur,

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy and C₁-C₄-alkyl,

and

E is $C\equiv C$, ~~arylene and heteroarylene, where arylene and heteroarylene~~ phenylene, thienylene, oxadizolylene, pyrrolylene, furanylene, pyrimidinylene, or pyridinylene wherein each ring system respectively may be substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C_1 - C_4 -alkoxy and C_1 - C_4 -alkyl,

or a solvate, a salt ~~or a solvate of a salt~~ thereof.

3. (Currently Amended) The compound of formula (I) of Claim 1, in which

R^1 is 1-azabicyclo[2.2.2]oct-3-yl,

R^2 and R^3 are hydrogen,

R^4 is hydrogen, fluorine, chlorine, bromine, cyano, amino, trifluoromethyl, trifluoromethoxy, C_1 - C_4 -alkyl, C_1 - C_4 -alkylcarbonyl, C_1 - C_4 -alkylamino, formyl, hydroxycarbonyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkoxycarbonyl, C_1 - C_6 -alkylthio, C_1 - C_4 -alkylcarbonylamino, C_1 - C_4 -alkylaminocarbonyl, C_1 - C_4 -alkylsulphonylamino, C_3 - C_6 -cycloalkylcarbonylamino, C_3 - C_6 -cycloalkylaminocarbonyl, pyrrolyl, C_1 - C_4 -alkylaminocarbonylamino, ~~heterocyclylcarbonyl, heterocyclylcarbonylamino, heteroarylcarbonylamino,~~ hydroxyl, phenyl ~~or heterocyclyl~~ morpholinyl, oxypiperidinyl, oxopyrrolidinyl, oxomorpholinyl, pyrrolidinyl, morpholinylcarbonyl, piperidinyl, pyridinyl, dihydropyrrolylcarbonyl, C_1 - C_4 -alkylpiperizinylcarbonyl, isoxazolecarbonylamino,

tetrahydrofuranylcarbonylamino, furoylamino, piperidinylcarbonyl, or piperidinylcarbonyl,

where C₁-C₄-alkyl may optionally be substituted by hydroxyl, cyano, amino, C₁-C₄-alkylaminocarbonylamino, C₁-C₄-alkylaminocarboxyl, ~~heterocycl~~
morpholinyl or aryl,

C₁-C₄-alkylaminocarbonyl may optionally be substituted by C₁-C₄-alkoxy or C₁-C₄-alkylamino, and

C₁-C₄-alkylcarbonylamino may optionally be substituted by C₁-C₄-alkoxy, ~~and heterocycl may optionally be substituted by oxo,~~

A is oxygen,

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy and C₁-C₄-alkyl,

and

E is $C\equiv C$, ~~arylene and heteroarylene, where arylene and heteroarylene~~ phenylene, thienylene, oxadizolylene, pyrrolylene, furanylene, pyrimidinylene, or pyridinylene wherein each ring system respectively may be substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C_1 - C_4 -alkoxy and C_1 - C_4 -alkyl,

or ~~a solvate, a salt or a solvate of a salt~~ thereof.

4. (Currently Amended) A compound of formula (I) of Claim 1, in which

R^1 is 1-azabicyclo[2.2.2]oct-3-yl,

R^2 is hydrogen or C_1 - C_6 -alkyl,

R^3 is hydrogen, halogen or C_1 - C_6 -alkyl,

R^4 is hydrogen, halogen, cyano, amino, trifluoromethyl, trifluoromethoxy, C_1 - C_6 -alkyl, C_1 - C_6 -alkylcarbonyl, C_1 - C_6 -alkylamino, formyl, hydroxycarbonyl, C_1 - C_6 -alkoxy, C_1 - C_6 -alkoxycarbonyl, C_1 - C_6 -alkylthio, C_1 - C_6 -alkylcarbonylamino, C_1 - C_4 -alkylsulphonylamino, C_3 - C_8 -cycloalkylcarbonylamino, pyrrolyl, C_1 - C_6 -alkylaminocarbonylamino, ~~heterocyclylcarbonyl, —phenyl or —heterocyclyl~~ morpholinyl, oxypiperidinyl, oxopyrrolidinyl, oxomorpholinyl, pyrrolidinyl, morpholinylcarbonyl, piperidinyl, pyridinyl, dihydropyrrolylcarbonyl, C_1 - C_4 -alkylpiperizinylcarbonyl, isoxazolecarbonylamino, tetrahydrofuranylcarbonylamino, furoylamino, piperidinylcarbonyl, or piperidinylcarbonyl,

where C₁-C₆-alkyl may optionally be substituted by hydroxyl, amino, C₁-C₆-alkylaminocarbonylamino, C₁-C₆-alkylaminocarboxyl, ~~heterocyclyl~~ morpholinyl or aryl,and

C₁-C₆-alkylcarbonylamino may optionally be substituted by C₁-C₆-alkoxy, ~~and~~

~~heterocyclyl may optionally be substituted by oxo,~~

A is oxygen or sulphur,

the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, formyl, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkyl and C₁-C₆-alkoxy,

and

E is C≡C, ~~arylene and heteroarylene, where arylene and heteroarylene~~ phenylene, thienylene, oxadizolyene, pyrrolylene, furanylene, pyrimidinylene, or pyridinylene wherein each ring system respectively is optionally substituted by

radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkoxy and C₁-C₆-alkyl,

or a solvate, a salt or a solvate of a salt thereof.

5. (Currently Amended) The compound of formula (I) of Claim 1, in which

R¹ is 1-azabicyclo[2.2.2]oct-3-yl,

R² is hydrogen or C₁-C₆-alkyl,

R³ is hydrogen, halogen or C₁-C₆-alkyl,

R⁴ is hydrogen, halogen, cyano, trifluoromethyl, trifluoromethoxy, C₁-C₆-alkyl, C₁-C₆-alkoxy or ~~heterocyclyl~~ morpholinyl, piperidinyl or pyrrolidinyl, where alkyl is optionally substituted by a hydroxyl radical,

A is oxygen or sulphur,

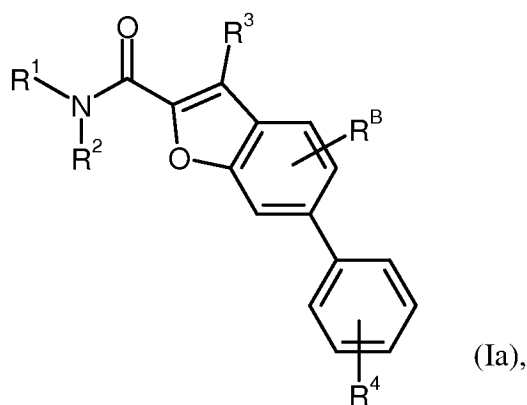
the ring B is benzo or pyrido, each of which are optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkyl and C₁-C₆-alkoxy,

and

E is ~~C≡C, arylene and heteroarylene, where arylene and heteroarylene~~ phenylene, thienylene, oxadizolylene, pyrrolylene, furanylene, pyrimidinylene, or pyridinylene wherein each ring system respectively is optionally substituted by radicals from the series halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C₁-C₆-alkyl and C₁-C₆-alkoxy,

~~or a solvate, a salt or a solvate of a salt~~ thereof.

6. (Currently Amended) The compound of claim 1 having the formula (Ia)



in which

R¹ is (3*R*)-1-azabicyclo[2.2.2]oct-3-yl,

R² and R³ are, independently of one another, hydrogen or methyl,

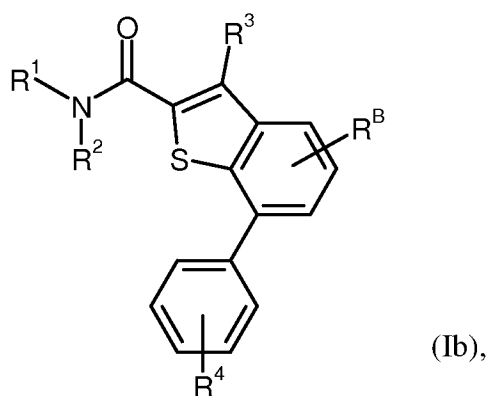
R^4 is hydrogen, halogen, cyano, trifluoromethyl, trifluoromethoxy, C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy or ~~or heterocyclyl~~ morpholinyl, piperidinyl or pyrrolidinyl, where alkyl is optionally substituted by a hydroxyl radical,

and

R^B is hydrogen, halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C_1 - C_6 -alkyl or C_1 - C_6 -alkoxy,

or a solvate, a salt or a solvate of a salt thereof.

7. (Currently Amended) The compound of claim 1 having the formula (Ib)



in which

R^1 is (3*R*)-1-azabicyclo[2.2.2]oct-3-yl,

R^2 and R^3 are, independently of one another, hydrogen or methyl,

R^4 is hydrogen, halogen, cyano, trifluoromethyl, trifluoromethoxy, C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy or ~~heterocyclyl~~ morpholinyl, piperidinyl or pyrrolidinyl, where alkyl is optionally substituted by a hydroxyl radical, and

R^B is hydrogen, halogen, cyano, trifluoromethyl, trifluoromethoxy, nitro, amino, C_1 - C_6 -alkyl and C_1 - C_6 -alkoxy,

or a solvate, a salt or a solvate of a salt thereof.

8. (Currently Amended) The compound of Claim 1, wherein

R^1 is (3*R*)-1-azabicyclo[2.2.2]oct-3-yl,

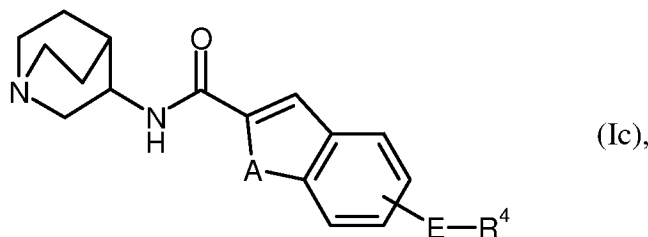
R^2 and R^3 are hydrogen,

R^4 is hydrogen, fluorine, chlorine, bromine, trifluoromethoxy, hydroxymethyl, methoxy or ~~or heterocyclyl~~ morpholinyl or piperidinyl, and

R^B is hydrogen, halogen, cyano, trifluoromethyl, trifluoromethoxy or C_1 - C_4 -alkyl,

or a solvate, a salt or a solvate of a salt thereof.

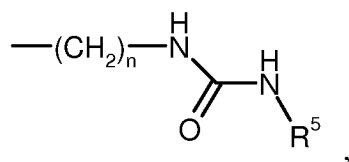
9. (Currently Amended) The compound of claim 1 having the formula (Ic)



in which

E is phenylene,

R⁴ is C₁-C₆-alkoxy, aminomethyl, hydroxycarbonyl, C₃-C₈-cycloalkylcarbonylamino, a group of the formula



where

R⁵ is C₁-C₆-alkyl,

n is zero, 1, 2, 3 or 4,

or

~~5- to 6-membered heterocyclyl-~~ morpholinyl, piperidinyl or pyrrolidinyl, which is optionally substituted by oxo,

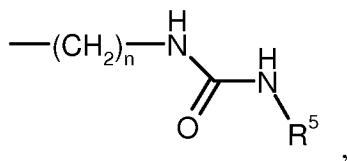
A is sulphur or oxygen,

~~or a solvate, a salt or a solvate of a salt thereof.~~

10. (Currently Amended) The compound of claim 9

E is phenylene,

R⁴ is C₁-C₄-alkoxy, aminomethyl, hydroxycarbonyl, C₃-C₆-cycloalkylcarbonylamino, a group of the formula



where

R⁵ is C₁-C₄-alkyl,

n is zero, 1 or 2,

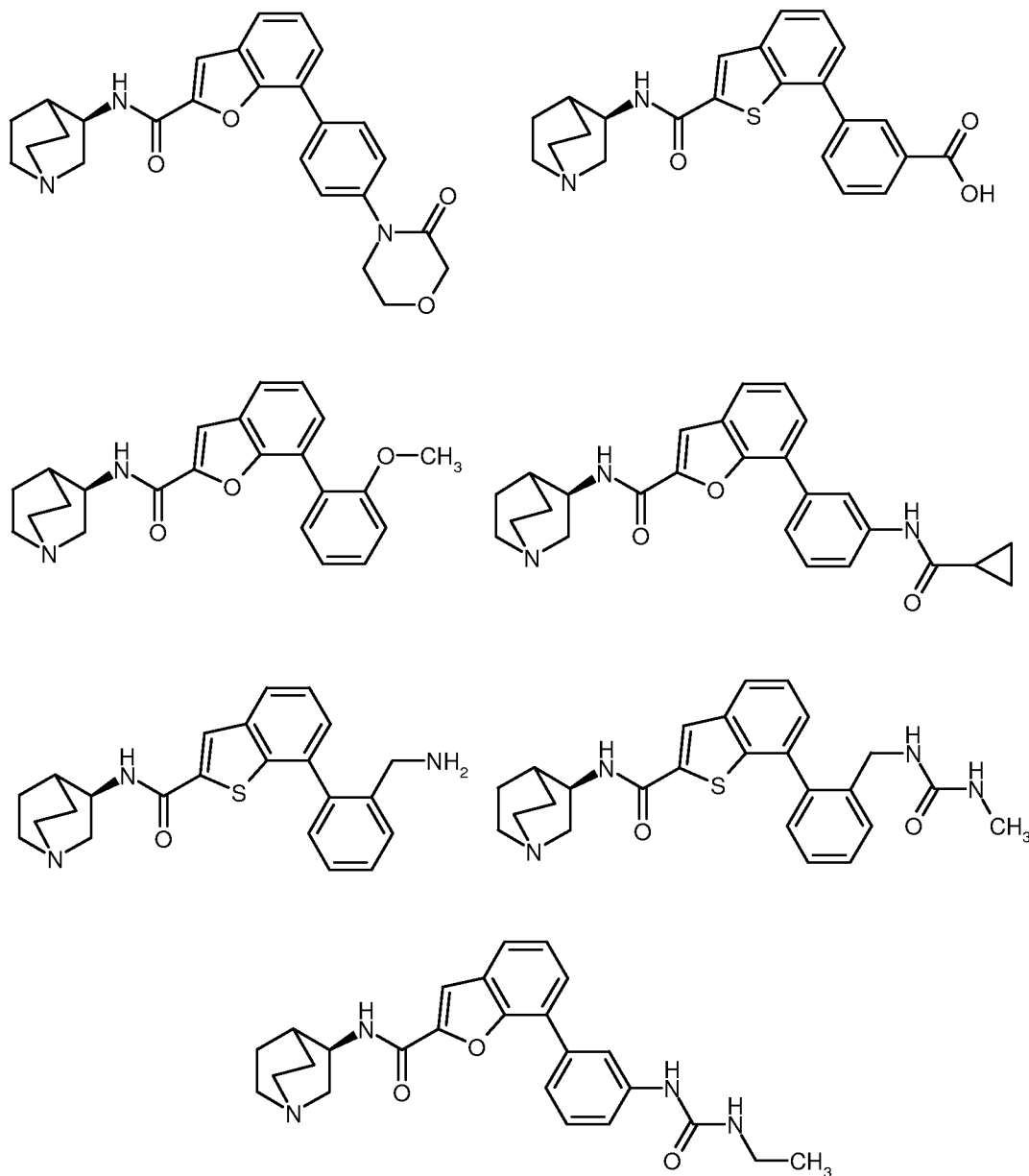
or

~~5 to 6 membered heterocyclyl~~ morpholinyl, piperidinyl or pyrrolidinyl, which is optionally substituted by oxo,

A is sulphur or oxygen,

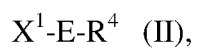
~~or a solvate, a salt or a solvate of a salt thereof.~~

11. (Currently Amended) The compound of claim 1



or a solvate, a salt or a solvate of a salt thereof.

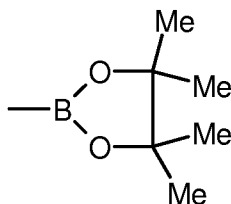
12. (Currently Amended) A process for the preparation of a compound of formula (I) of Claim 1, in which a compound of formula (II)



in which

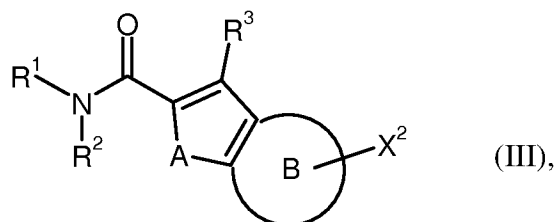
R^4 has the meanings indicated in Claim 1, and

X^1 is $-B(OH)_2$ or



in the case where E is arylene or heteroarylene, and is hydrogen in the case where E is $-C\equiv C-$,

is reacted with a compound of the formula (III)



in which

R^1 , R^2 , R^3 , A and the ring B have the meanings indicated in Claim 1, and

X^2 is triflate or halogen, preferably chlorine, bromine or iodine,

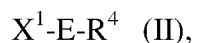
and where appropriate

[A] the resulting compound of formula (I) is alkylated on the quinuclidine nitrogen atom with an appropriate alkylating reagent, or

[B] the resulting compound of formula (I) is oxidized on the quinuclidine nitrogen atom with a suitable oxidizing agent,

and the resulting compound of formula (I) is optionally converted to or ~~a solvate~~, a salt or ~~a solvate of a salt~~ with an appropriate (i) ~~solvent~~ and/or (ii) base or acid.

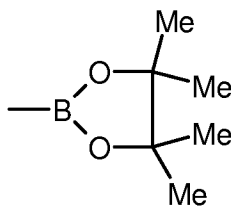
13. (Currently Amended) A process for the preparation of a compound of the formula (I) of Claim 1, in which a compound of formula (II)



in which

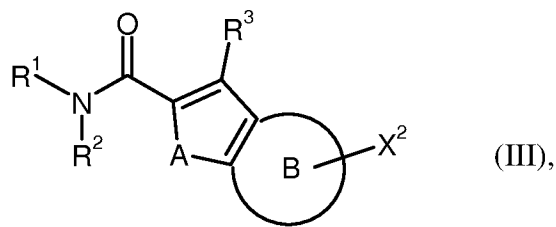
R^4 has the meanings indicated in Claim 1, and

X^1 is $-B(OH)_2$ or



in the case where E is arylene or heteroarylene, and is hydrogen in the case where E is $-C\equiv C-$,

is reacted with a compound of the formula (III)



in which

R^1 , R^2 , R^3 , A and the ring B have the meanings indicated in Claim 1, and

X^2 is triflate or halogen, preferably chlorine, bromine or iodine,

and the resulting compound of formula (I) is optionally converted to or ~~a solvate~~, a salt ~~or a solvate of a salt~~ with an appropriate (i) ~~solvent and/or~~ base or acid.

14. (Canceled)

15. (Previously Presented) A pharmaceutical composition comprising at least one compound according to any of Claims 1 to 11 and at least one pharmaceutically acceptable, essentially nontoxic carrier or excipient.
16. (Canceled)
17. (Canceled)
18. (Canceled)
19. (Previously Presented) A method for the treatment or prophylaxis of impairments of perception, concentration, learning and/or memory comprising administering to a human or animal at least one compound according to any of Claims 1 to 11.